

ON THE
CAPACITY OF THE SKULL
OF A
CERTAIN NUMBER OF CELEBRATED
MEN

by Doctor Gustave Le Bon

ROBERT K. STEVENSON: Translator, Editor and Communicant



BOILEAU
Skull Capacity: 1690 Cubic Centimeters

MESSAGE

My Friend,

The Secretary of the Anthropology Society of Paris, knowing that I am in contact with you, has requested that I extend this report to you. It should come as no surprise that the members of the Society were deeply honored by your presence at their evening meeting of July 3rd, 1879. The following report encompasses both Doctor Gustave Le Bon's presentation of his paper, "On the Capacity of the Skull of a Certain Number of Celebrated Men," and the ensuing discussion, all of which, I recall, you found highly provocative and engaging.

Doctor Le Bon, meanwhile, wishes me to inform you that his major work, "Anatomical and Mathematical Researches Into the Laws of the Variations of Brain Volume and their Relation to Intelligence," which appeared in the *Revue d'Anthropologie*, has just been accorded an award from the French Academy of Sciences. He mentioned this work during his presentation, you may remember, and I strongly recommend that you make yourself aware of this study, should you not already possess a copy. It's most extraordinary.

I trust that your anthropological interests continue to expand, as do mine, and upon your return I look forward to discussing them with you at a fine café I have recently discovered along the Boulevard Saint-Germaine.

Robert K. Stevenson

Paris

September 12, 1879

"On the Capacity of the Skull of a Certain Number of Celebrated Men"

by Doctor Gustave Le Bon

ANTHROPOLOGY SOCIETY OF PARIS
Meeting of July 3, 1879

Messieurs, I have the honor of presenting before the Society the results of research that I have seen to undertake on a very curious collection which the Natural History Museum of Paris possesses, and which is composed of original skulls relating to known persons, some of whom are very famous, as included among them are Marshal Jourdan, General Wurmser, Boileau, Gall, etc. Many of these skulls originate from fragments previously reassembled by Gall during the period of his greatness, others from the estate of a prominent collector, Dumoutier, whose specialty was robbing the sepulchral vaults of illustrious men for the benefit of his collection. These two collections, which emanate from the uniting of pieces of diverse provenances, have been acquired at great expense by the Museum of Paris, and afterwards have been stored for some time in one of the rooms of the laboratory of this establishment, where I have been able to study them, thanks to the obligingness of the laboratory's directors.

Their scientific study has not yet been made; for, among the various records that the Museum possesses about them, there does not exist a single measurement, and, relative to all those skulls which had passed through the hands of Gall, not one record in his catalog indicates those which were striking by their smallness or their largeness.

It is not necessary to insist at length on the interest that exists for anthropology to study the skulls representing well-known individuals. The skulls that our museums possess nearly always are those of unknown persons, and if their study may furnish some information from the standpoint of the race, they do not supply anything from the standpoint of the affinities possibly existing between the exterior forms and the intellectual aptitudes.

The study of these skulls was, moreover, of considerable interest to me, because it enabled me to verify, regarding those persons whose aptitudes had been well understood, some of my conclusions appearing in a recent work of mine concerning the affinities existing

between the development of the skull and the corresponding level of intelligence--conclusions which have occasioned lively polemics within important French and foreign reviews. I shall recount here only a few of these conclusions:

Among the diverse factors correlating with the intellectual condition, one of the most important is the volume of the brain. Within each race the most voluminous skulls nearly always belong to the most intelligent persons.

In proportion as one rises up the scale of the races, greater differences in brain capacity are seen amongst individuals. Far from restricting the differences existing among men, civilization only serves but to increase them, and consequently, it is not towards an intellectual equality that we advance, but towards an inequality more and more accentuated. Anatomical, and therefore physiological, equality is not possible among people belonging to entirely inferior races. From the anatomical standpoint, and intellectual as well, there exists among the diverse classes of the superior races immense differences. A great number of men occupy, by the very small volume of their skulls, an intermediate place between the anthropoid apes and those individuals whose brains are the most developed.

The research whose results I have seen to set forth deals only with cranial capacity. In no way, like I have already said, and I stress besides, have I held true for a single instant that skull volume is the sole factor which determines the development of the intelligence. Plenty of other factors, the shape for example, as I hope to fully demonstrate some day, account for this; but, because one is unable to simultaneously grapple with all these factors, I shall begin with one of them. The volume is the one that I have entertained to approach, and it is for this single matter that I again present myself.

If one eliminates from the collection of which I have spoken the women, criminals, and pathological persons, classifications comprising another part of the Museum from where I have conducted my research, there remains 42 skulls having belonged to individuals who were well-known during their lifetime. A good part pertain to quite famous men, others to persons possessing an intelligence obviously well above the average, and others to individuals who, although they had not presented proof of a superior intelligence, figure in the collection only because of the high social position which they had occupied in the world. These are then, in reality, distinct categories; but, as one may debate about their limits, and given that I do not

wish to see anyone accusing me of having eliminated unfavorable persons from my thesis, I have brought together all of the skulls before separating them. In spite of incorporating disadvantageous data, the results obtained are, as I shall demonstrate, most convincing, and absolutely confirm the theory that I have previously expounded.

The average capacity of these 42 skulls is, in fact, enormous; whereas the average for one of the most intelligent contemporary groups, modern day Parisians of the masculine sex, is 1559 cubic centimeters, that of the 42 famous men is 1682 cubic centimeters. Now, given that the average for negroes is about 1430 cubic centimeters, it follows that the average capacity of the skulls of the well-known or eminent men surpasses by almost as much that of the Parisians as the skull volume of the latter surpasses the cranial capacity of the negroes.

If we classify the skull capacities by series, the comparison will be seen to be even more striking. Among 100 modern day Parisians, 12 out of 100 attain 1700 cubic centimeters; among the 42 famous men, about half exceed this capacity. Respecting these same 100 Parisians, there is not anyone who exceeds 1900 cubic centimeters; with 100 celebrated men one counts 7. Here is the table indicating these groupings:

Skull Capacities of Forty-two Famous or Distinguished Men Compared to Modern Parisians.

<i>Cubic Centimeters</i>	<i>Modern Parisians.</i>	<i>Famous Men.</i>
	<i>Ratio per 100.</i>	<i>Ratio per 100.</i>
1300 to 1400	10.4	2.4
1400 to 1500	14.3	4.8
1500 to 1600	46.7	16.6
1600 to 1700	16.9	35.8
1700 to 1800	6.5	23.83
1800 to 1900	5.2	9.5
1900 to 1950	--	7.1
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	100.00	100.00

As I mentioned previously, I have not done any sorting with this collection. If I had effected the suggested separations, I would have attained other capacity ratios even more considerable. The great men of this collection, La Fontaine, Boileau, Volta, Marshal Jourdan, Gall, etc., possess truly immense skulls. Here is now the capacity of 26 skulls pertaining to the most well-known persons:

Skull Capacity of a Certain Number of Celebrated Men
(from the collection of the Museum)

	Volume in Cubic Centimeters
De Roquelaure de Bussuejole, Bishop of Senlis, chief almoner of Louis XV	1365
Alixinger, poet.	1505
Wurmser, Austrian general ¹	1510
Juvenal des Ursins (Guillaume), Chancellor of France	1525
Unterberger, painter and skillful engineer	1660
Boileau	1690
Gall	1692
Descartes ²	1700
Careme, famous for his culinary productions and inventions	1700
Chenevix, eminent chemist	1700
De Zach, renowned astronomer and mathematician.	1715
Marshal Jourdan	1725
David, very sharp mathematician	1725
Jean the Fearless, Duke of Burgundy (mold)	1750
Cassaigne, distinguished jurist, counselor to France's highest court of appeal	1755

Volume
in Cubic Centimeters

Abbe Gauthier, author of numerous highly esteemed pedagogical works	1770
Junger, poet	1775
Kreibig, well-known musician	1783
Blanchard, aeronaut famous for his daring and his research on ways to steer and control balloons	1790
Voigt Lander, celebrated mathematician and engineer	1820
Thouvenin, great manufacturer gifted with superior intelligence	1825
Blumauer, poet	1840
Volta (mold)	1850
Besard, very clever banker	1940
Spurzheim, collaborator of Gall (mold)	1950
La Fontaine (mold)	1950
Average Capacity = 1732 cubic centimeters	

Almost all of these skulls present, as you can see, truly immense capacities. If the anthropologist of the future discovers some day in the museum these skulls without any accompanying information about them, he will surely believe that they belonged to a race of giants, not analogous to any of the other human races existing then.

¹Compare this skull with Jourdan's. Wurmser, a general always defeated, with but 1510 cubic centimeters of capacity; Jourdan, a general nearly always victorious, at 1725 cubic centimeters.

²The skull of Descartes was given to the Museum by Cuvier, who had received it from Berzelius. At the time of its being forwarded to Paris in 1821, the Institute appointed a commission to determine the authenticity of this skull. Among the pieces of information included along with the account of Delambre that we have before our eyes, it turns out that the skull of Descartes had been stolen from the coffin bearing the remains of the celebrated philosopher at the time of its transfer from France in 1666 by Planstrom, officer of the guards of Stockholm. Upon the frontal bone exists, in effect, an inscription in Swedish indicating that the skull was seized and carefully guarded by Planstrom. After his death it passed through many hands before finally being put up for sale, whereupon it was purchased by Berzelius. As Delambre has authoritatively noted, it is clearly impossible after the elapse of so many years to pronounce with certitude upon the authenticity of this curious relic. The lower jawbone is entirely missing.



LA FONTAINE

Pre-eminent French poet; author of the *Fables*

Skull Capacity: An enormous 1950 cubic centimeters

You will note, messieurs, that amongst this collection of skulls of intelligent men, a small number exist where the capacity is below average. I must challenge the intellectual worth of their possessors, and say, for example, that Bishop Roquelaure never distinguished himself with a very high intelligence, that Alxinger was a poet quite rapidly forgotten, that Wurmser, a general who always lost, had a small head, while Jourdan, a general who nearly always won, had a very large one. I wish to emphasize, as I have already done, that it's exceptionally rare where a great intelligence combined with a small head can be identified. No doubt then, diverse factors more or less known, such as the extent of the circumvolutions, the thickness of the cortical layer, the quality of the cells, and the reciprocal disposition of the parts, exercise a superior influence to that of volume. The thing that few arrive at, but understand only quite rarely--and by no means can the controlling law be modified--is that the greatest intelligences generally reside within the largest skulls.

Is it necessary for one to conclude from the preceding that if the great intelligences possess most frequently the largest heads, then the largest heads always have a high intelligence? I do not believe this is so, and here are my reasons:

The brain is not just the seat of intelligence. It is also more or less intimately involved with all the functions: muscular activity, the development of the sentiments, etc., and we understand quite well that those races remarkable for their energy, courage, activity, etc. are able to have a more developed skull than those races who are their superiors by their intelligence. This has been precisely the case with the Gauls, whose skull was generally sufficiently developed. I do not know if even one of them could handle being a shopkeeper, the tenor of modern lives being more advanced than the state of the Gauls; but what is certain is that the modern French cannot dispense the intrepidity, energy, and spirit of independence which our formidable ancestors rendered against the Romans. Indeed, it was said of the Gauls by the historian Salluste that when our forefathers fought the Romans, they didn't do it for the glory, but for the principle. Certainly, the Romans were much more civilized than the Gauls, but memories of the sustained struggles against them were so terrible that within the Roman law which accorded exemption from military service to the priests and old men, it was stipulated that this exemption would cease at the time of war against this people; and it in effect required all the immense power of the Roman civilization, and all the genius of Caesar

in order to triumph over these barbarous hordes who only had for themselves their intrepidity and their valor.

Admitting this fact, that one is able to find among large-headed individuals of ordinary intelligence those whose activity and passions are most developed, we can understand quite well how it is that criminals often possess voluminous heads.

Among the skulls which belonged to individuals whose cerebral development was more connected with the intensity of the passions than with the intelligence, the development generally inclines to the posterior part of the head. This is a conformation I have observed with respect to several criminals. Many among them, and I am able to speak knowingly, having with my hands measured more than 50 guillotined heads, possess a quite voluminous skull. Our learned friend Doctor Bordier has already signalized this fact. I second his observation, that it is amongst criminals where one encounters the largest and smallest skulls. If one were able to give a psychological explanation for this apparent anomaly, I would say that the largest heads relate to those subjects whose passions and activity are most developed and who have been led to crime through the excess of this same development. The small heads belong to those persons of feeble intelligence, incapable of judgment or much thinking with their deficient intellectual resources (which are inadequate for their existence), and that their incapacity leads them to crime.

I still have plenty of things to say, messieurs, about these interesting collections. I turn next to where I shall examine these skulls from the standpoint of their size, and then consider the psychological aspect which I have entirely passed over until now. I have shown in a preceding work that the difference in cerebral capacity, which one believes is so profound between men and the great anthropoid apes when comparing the average capacity of their brains, disappears when one has conveyed these comparisons in a series, and that a large number of men--the immense majority--occupy, by the minimal volume of their skulls, an intermediate place between the anthropoid ape and other men. Next, I must endeavor to point out that the psychological differences, so great when one compares the intelligence of the anthropoid ape with that of the civilized man, and only depicted up to now by the psychologists, are able to be easily bridged; this happens when one studies the development of

civilized man's inferiors: women, the savages, and infants, in whom one is able to reconstitute all the stages through which the human intelligence must successively pass.

Also, without deviating away from our own race, and setting aside the categories comprising the inferior entities I have spelled out, in taking on the one hand the ignorant peasant who does not read nor write, and has, according to modern linguists, but three hundred words in his vocabulary, and comparing him to the savant who possesses more than two thousand along with the corresponding ideas, I can demonstrate that this peasant occupies, as much by the minimal volume of his skull as by the low level of his intelligence, an intermediate place between the highly developed man and the great anthropoid apes which science assigns to our ancestors.¹

¹ The groups of people who appear to resemble the ancient inhabitants of Gaul, that is to say the Bretons and the Auvergnats, have inherited the voluminous skull of their ancestors, and the average capacity of their heads is slightly higher than those of modern illiterate Parisians. It is quite otherwise, as is well known by the hat-makers, with peasants in general. After measuring many circumferences of the head, carried out on hundreds of peasants of the Beauce, I do not believe that the average capacity of their skulls exceeds more than 1400 cubic centimeters. You will discover all the elements of these calculations in my treatise: "Anatomical and Mathematical Researches Into the Laws of the Variations of Brain Capacity and their Relation to Intelligence" (*Revue d'Anthropologie*, January, 1879).

DISCUSSION

Madame CLÉMENCE ROYER. I think that your study, Doctor Le Bon, merits interest if it had harmonized the stature, chiefly the volume of the body with the volume of the skull; for example, Descartes had a small stature, but you have informed us that his head was large.

The weight of the body compared to that of the brain will yield exact relations which can certainly modify some of your conclusions; plus, it is mathematically irregular to establish relations between linear measures of capacity.

Doctor GUSTAVE LE BON. Madame, I have studied, within another treatise, the influence of stature upon the weight of the brain and proved that this influence is very weak. Admitting (by an evidently impossible hypothesis) that all the famous men whose skulls I have measured had been giants, that would not have added more than an extra 100 cubic centimeters to the average capacity of their skull. We find sums which are far more alike than any of the differences I have described, a finding which one can only attribute to these men's superior intelligence.

As for the weight of the persons to which I have been concerned, Madame Clémence Royer should herself recognize the impossibility of determining it. The weight, besides, varies above all with the height, and I doubt that one could attribute more importance to it than to the latter element. The weight of the body frequently increases with age, while on the other hand the weight of the brain diminishes. The body of the Negroes is larger than our own, yet their brain is less heavy.

Doctor PAUL BROCA. The comparison of body weight with the brain is difficult to do with the human species, but Lauret did it with a series of animals; he found that this relation varies from one species to another. Just by knowing the body weight, one is not able to deduce the weight of the brain. With animals the quantity of brain necessary to animate a weight conferred on an animal varies.

It also varies with the human races; for it is incontestable that the Mongolian races are, all things being equal, less intelligent than our own. And yet the large size of their brain does not convey any benefit to their intellectual situation.

The opposite case is met with for certain Negroes. Gratiolet has remarked: "The Venus Hottentot, it is believed, is sufficiently intelligent with her small brain; among us, with a similar brain, she would be an idiot!"

These problems are, moreover, very complex. For example, peasants have a larger brain than Parisians, and especially countrywomen have a larger brain than the ladies of Paris. But it is necessary to keep in mind the vexatious influence which the extreme division of labor is able to exercise upon the intelligence; it is in Paris where one can see workers devoting their entire lifetime at being at the point of a needle, while their neighbor has no other occupation but one which dulls the mind. By contrast, out in the countryside it's obligatory that a man be elsewise an encyclopaedist in order for him to earn his bread. Maybe it is for these reasons that I have found that the country people of Brittany and Auvergne have larger heads than the Parisians. These Bretons and Auvergnats are, as well, men of short height, valiant and intelligent. It was their ancestors who fought Caesar and who later on defended by hand-to-hand combat the Gallo-Roman civilization against the invasion of the Barbarians.

Doctor GUSTAVE LE BON. I do not at all share your opinion, Doctor Broca, relative to the size of the head among the peasants. If you had found it to be so considerable, it is because you measured Auvergnats and Bretons, that is to say Celts of pure race. The research which I conducted among the peasants of the Beauce have produced results just the opposite.

Monsieur GABRIEL DE MORTILLET. At Grenoble, the mountain peasants, who nevertheless are pure Celts, are accustomed to wearing hats of a special shape, in rigid felt. These hats have been made long beforehand, and the hat-makers have observed that it is necessary to produce a slighter size than those for the townspeople.

Monsieur PELLARIN. I recall that Monsieur Durand de Gros found at Rodez, after making inquiry with each of the hat-makers, that the city dwellers had a larger head than the country people.

Doctor COUDEREAU. Doctor Broca, you have just now explained to us that the quantity of brain necessary for intellectual functions varies with the races. I therefore ask you if it will vary according to the sex, and if then this intellectual functions requirement has to be the secret of the difference between the brain weight of women and men.

Doctor PAUL BROCA. I cannot compare in only a few minutes the country people with the Parisians; special industrial conditions apply to Paris. Nowhere is the difference between the brain weight in the two sexes so considerable as that which is found within this city. Why this difference? It is because in Paris women may earn their living with positions where they never exercise their mind. The situation is not the same in the countryside.

I shall now examine the question that you have posed me, Doctor Coudereau. It is complex. Obviously, it is necessary to take into account the difference in height which separates the two sexes. This influence, though, is not very considerable; it is notable, nevertheless. Doctor Le Bon, in grouping together a certain number of tall individuals and, also, the same number of short men, discovered that the average weight of their skulls will present a difference in volume of about 100 cubic centimeters, at the expense of the short men. This difference in height does not represent the totality responsible for that which we find between the two sexes.

The rest of this difference does not seem to me too great because one may be able to attribute it to education.

One may admit this point because I have demonstrated that, in general, a man who has received suitable instruction possesses a larger skull than an ignorant person. To amplify, I have taken the horizontal circumference of the skull among a certain number of medical interns and externs, as well as those of the nurses. I found that it was the students who had the advantage; undoubtedly, they owed it to their proper education and perhaps to their being descended from parents who were equally well-raised.

POSTSCRIPT

And so concluded formal discussion of Doctor Le Bon's paper at the July 3rd, 1979 meeting of the Anthropology Society of Paris. Your own comments, provided off-the-record, were most insightful and well-received by the members, who all expressed their heartfelt desire that you attend again in the future.